



Hardy Fern Foundation Quarterly



Winter 2014

THE HARDY FERN FOUNDATION

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The Hardy Fern Foundation was founded in 1989 to establish a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community. Many rare and unusual species, hybrids and varieties are being propagated from spores and tested in selected environments for their different degrees of hardiness and ornamental garden value.

The primary fern display and test garden is located at, and in conjunction with, The Rhododendron Species Botanical Garden at the Weyerhaeuser Corporate Headquarters, in Federal Way, Washington.

Affiliate fern gardens are at the Bainbridge Island Library, Bainbridge Island, Washington; Bellevue Botanical Garden, Bellevue, Washington; Birmingham Botanical Gardens, Birmingham, Alabama; Coastal Maine Botanical Garden, Boothbay, Maine; Dallas Arboretum, Dallas, Texas; Denver Botanic Gardens, Denver, Colorado; Georgia Perimeter College Garden, Decatur, Georgia; Inniswood Metro Gardens, Columbus, Ohio; Lakewold, Tacoma, Washington; Lotusland, Santa Barbara, California; Rotary Gardens, Janesville, Wisconsin; Strybing Arboretum, San Francisco, California; University of California Berkeley Botanical Garden, Berkeley, California; and Whitehall Historic Home and Garden, Louisville, Kentucky.

Hardy Fern Foundation members participate in a spore exchange, receive a quarterly newsletter and have first access to ferns as they are ready for distribution.

Cover design by Willanna Bradner

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“PTERIDOTRIVIA”

1. In 1908 British fern expert E. J. Lowe wrote an excellent book, British Ferns. How many varieties of *Phyllitis* (*Asplenium*) *scolopendrium*, the Hart's Tongue Fern, does he describe?
2. What was the botanical name of the species at the time?

Visit our website, www.hardyferns.org for the answers!

President's Message

Winter ~ 2014

Best Wishes to all for this New Year.

This month our efforts will be in getting ready for the Northwest Flower & Garden Show held in the Seattle Convention Center from Feb. 5th to the 9th. 2014 marks the 25th year for the Hardy Fern Foundation. HFF has a double sized booth this year to give some more room to commemorate this Silver Anniversary Year. The Northwest Flower and Garden Show is the harbinger of spring for NW gardeners and is always looked forward to intensely. It pulls us out of the grey winter's sleep with new plants, great display gardens and lectures, educational booths and row upon row of garden and landscape materials and supplies to fulfill your every need. It is also a great place to get new ideas for the home landscape or garden. If you are attending make sure to stop by the HFF booth and check it out.

Last November 16th, HFF held its 3rd annual Fall Social at the University of WA Center for Urban Horticulture. It was a very nice gathering of members and fern enthusiasts, with a great potluck and lasagna lunch with delicious deserts (pie). The program included a very interesting and informative slide show and presentation by Pat Riehl from her recent fern trip to South Africa. Thank You, Pat. HFF members bought fronds of a 100 or so different ferns that were set in labeled stem vases which were displayed on a long table for viewing and observation. (See photo page 9) It was beautiful and so interesting. Diversity is a beautiful thing. Thank You Ritchie Steffen for this great idea.

This coming year HFF is planning a number of lectures and presentations in conjunction with the 25th Anniversary of the Foundation. Efforts will continue in fundraising for HFF so that the great things that HFF does continue on into the future. There will be plenty to learn about ferns in the future. It is estimated that there are about 12500 species of ferns on the planet with a few new species discovered each year, of which approximately 80 percent are found in the tropics. That leaves potentially 2500 temperate ferns. Even conservatively speaking there are easily 500 to 1000 fern species that exhibit horticultural value. I have not even counted the numerous forms of species and hybrids which are enough to boggle the mind.

From December 2nd to the 12th, we experienced a rather prolonged cold snap with temperatures in the teens and the low twenties. It was another brutal test for the marginally hardy plants that PNW gardeners are lured to and always willing to try, which includes ferns. The rest of this winter, so far, has been mild. The Rocky and Cascade Mountains provide a nice shield to shelter the PNW from the arctic blasts that much of the rest of the country is experiencing this winter. I keep having to define to myself the difference between climate and weather, when witnessing this very cold and snowy winter that my brothers and sisters are experiencing in the upper Midwest.

Dead of winter, croziers coiled tight, short grey days, necklace of insulating brown

fronds, cold soft rain, sleeping rhizomes, good book, warm fire, dreams of awaking ferns. Happy fern gardening.

John van den Meerendonk.

HFF Goes to the Fair

Carolyn Doherty

Puyallup, WA

In September 2013 the HFF undertook a new form of community outreach. We decided to have an informational booth at the Puyallup Fair. Previously, most of our activities have been focused on events in the Seattle area such as Fern Fest and the Flower and Garden Show. Having an exhibit at the Puyallup Fair gave us an opportunity to increase our exposure and reach a much larger demographic.



HFF booth at the Puyallup Fair
Photo courtesy of Carolyn Doherty

When we approached the Fair, they welcomed us and gave us several options. We decided to commit to a 3 day exhibit and a 10 foot by 10 foot booth in the new Evergreen Building which also houses the giant pumpkins, grange exhibits, and Master Gardeners. The dates they gave us were Friday, Saturday, and Sunday, September 13, 14, and 15 which was midway through the Fair's run. These turned out to be some of the most heavily visited days.

Jo Laskowski, Jerry and Carolyn Doherty planned and set up a simple booth that Friday morning. As a conversation starter, we decided on a small display of 5 plants with a sign asking "Which of these is not a fern?" Included were *Polystichum munitum*, *Adiantum pedatum*, *Asplenium trichomanes*, *Pyrrosia sheareri*, and *Asparagus densiflorus* 'Myers'. It was amazing how many people stopped to try to figure it out. Some knew the asparagus fern is not a true fern, but many more chose the *Pyrrosia*.

This opening gave us a chance to engage them in conversation and gauge their interest in ferns. We also included in our exhibit a display of a large variety of ferns that grow well here to show their diversity and garden worthiness.

We handed out literature about our organization and Fern Fest to hundreds of people. Many seemed very interested to hear about our Fern Fest and a large number even said they did not know about HFF until now.

All in all, it was a very successful experience. We spoke to hundreds of people and enjoyed raising their awareness about HFF and ferns in general.

For me personally, the best moment came when 2 little girls about 10 years old came up to the booth with their mother, looked me in the eye and asked very succinctly, "Exactly what should I know about ferns?"

Our three days at the Puyallup Fair were a great experience. I hope we get to do it again next year.

Dryopteris tokyoensis, Tokyo Wood Fern

James R. Horrocks

Salt Lake City, UT

This interesting species is a rather distinctive fern, unique enough in its appearance that it is unlikely to be confused with other species of this genus in its native habitat. It does share some similarities with *D. ludoviciana* (Rush) but in the latter, the pinnules are more elongated. A denizen of wooded areas in rather wet acidic soils, it is found in Japan, Korea, and China. It displays a stiff, upright look, attaining heights of three feet or more.

Description: The rhizome is rather short and erect to ascending, forming offshoots sparingly. The straw-colored stipes are roughly one sixth the length of the frond, grooved and densely covered with scales near the base. The lustrous pale brown scales are membranous and lanceolate to elliptic in outline and abruptly acuminate. They are a bit darker near the base. The fronds are deciduous and lanceolate, widest just above the middle and narrowing gradually toward both ends. The fronds form an attractive slender rosette or cluster. The 20 to 40 pairs of pinnae are widest near the midrib of the frond and taper toward the pinnae apex. Considered once-pinnate pinnatifid or pinnately lobed, the margins of pinnules are elliptically lobed but the apex of the pinnae is sharply toothed. The pinnae are slightly auricled at their base. The lower most pinnae are greatly reduced to mere ear-like lobes or technically deltoid-ovate. The fertile pinnae in the upper part of the frond are somewhat contracted. The sori are large and numerous, usually in two series and nearer to the costas than to the margins. The indusia are orbicular-reniform, that is, kidney shaped.



Dryopteris tokyoensis
Photo courtesy of Sue Olsen

Culture: The Tokyo wood fern is not recommended for inland areas that become fairly hot in summer. The author's attempt to grow it in Salt Lake City, Utah did not succeed. According to Hoshizaki, it has not done well in sunny southern California either, but it has been reported to have thrived in the humid coastal areas of the eastern United States. Its upright, slightly arching fronds are reported to be pale green to even darker green in more acidic shaded sites. The fronds can be from one to three feet in length, in fact, Martin Rickard reports seeing a collection in an Italian garden approaching four feet tall. This fern is certainly at its best in a somewhat acidic soil that is kept rather moist. Cold-hardy in Zone 5 through 8, it should be considered rather easily cultivated if there is ample humidity. The rhizomes form offshoots but John Mickel observes, "Unfortunately, it branches slowly, so divisions are infrequent." It succumbs early to dropping fall temperatures. All in all, this beautiful species is well worth attempting and should be left alone to slowly spread.

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**THANK YOU TO ALL OF OUR GENEROUS
DONORS FOR MAKING THE FALL FUND DRIVE
A SUCCESS!**

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BPS Cornwall Meeting

Friday 27th – Sunday 29th, September 2013

Tim Pyner, Southend-on-Sea, England

Cornwall is both the most southern and western county in England. The climate is relatively mild and wet. Partly due to the North Atlantic Drift that originates in the Caribbean, coastal areas in Cornwall rarely see snow and temperatures below freezing are infrequent. In contrast higher inland areas such as Bodmin Moor can be very cold and bleak. Some Cornish gardens are amongst the best known in the world. Many of these are located in sheltered river valleys near the coast. Not only do they benefit from the mild winters but are protected from the strong Atlantic gales that are such a feature of the Cornish weather. In these gardens ferns, particularly tree ferns, thrive as if it was their natural home. Therefore a BPS meeting combining gardens with natural sites was bound to be popular. With the added bonus of Martin Rickard as leader and assisted by knowledgeable local botanists the weekend proved a great success.

Members started gathering at our base hotel, The County Arms in Truro, on Thursday evening. This proved a comfortable and well-staffed hotel that managed to keep the varied fern enthusiasts happy all weekend. Martin gave a brief overview of what to expect but most of the evening was spent socialising and catching up with old friends.

Friday 27th September

After breakfast the group gathered together and travelled a short distance to our first site, Kennal Vale Nature Reserve at Ponsanooth. The reserve is located in a wooded valley and is also the site of a 19th century gunpowder works. Some of the buildings, walls and parts of the mill remain and are of great archaeological interest. Typical Cornish ferns abound on the steep banks and streamsides. *Dryopteris borreri*, *D. affinis*, *D. filix-mas*, *D. dilatata*, *Polystichum setiferum*, *Blechnum spicant* and *Asplenium scolopendrium* were all quickly found. *Hymenophyllum tunbrigense* has been recorded here and after some searching a few small colonies were found on sheltered banks. Martin made the best discovery, a few plants of *D. aemula*, not seen here for many years. In the small lane by the entrance good colonies of *Polypodium interjectum* and *P. x mantoniae* smothered stone walls.

Our first garden visit took place in the afternoon. We took a picnic lunch outside Penjerrick Garden and were joined by famous pteridologist Chris Page who lives in Cornwall and is involved in the management of the garden. On entering the garden large ferns immediately came into view. Firstly *Woodwardia radicans*, which has been grown in Cornish gardens since the 18th century and thrives in the mild, wet conditions. *Blechnum chilense* was huge, with fronds about 2m in length and forming large colonies. Sporelings were noted on shady banks and rotting stumps. Particularly impressive were some clumps of the beautiful *Dryopteris crispifolia*. I have seen this Azorean endemic in the wild and I have to say these were the most impressive plants I have seen anywhere. Moving down the valley we started to come across massive tree ferns, *Dicksonia antarctica*. Many of

these were over 5 metres tall and some much more. Dozens of these monsters are spread throughout the garden. A small road divides the garden and *Dicksonia* sporelings have established on the steep banks demonstrating how much they are at home. Also on these lane banks the rare native fern *Cystopteris diaphana* occurs, although doubts exist as to its true status at this site. Another exotic fern that is starting to naturalise is *Polystichum polyblepharum*. Many sporelings and young plants were seen along shady tracks and paths within the garden. I am sure it will start escaping in the future.

Saturday 28th September

The weather forecast for today was for rain in the morning clearing in the afternoon and was spot on. The day, in my opinion, was the highlight of the weekend. Two of the most interesting gardens in the country (the absolute best two in some peoples opinion!), real plantsman's gardens, were on the agenda. The morning was spent at Tregye near Truro. Due to the narrow, slippery paths and sensitivity of the plantings 3 groups of 10 were shown around in separate parties. In order for all the members to visit a separate group had spent the late afternoon of the previous day at Tregye. This garden was the property on the late, great plantsman, traveller and explorer Edward Needham. Most of his trips abroad were to China and the Himalayas and he introduced many new plants to cultivation. He was particularly interested in Rhododendrons, Scheffleras and of course ferns. Although he was a private man he had many contacts in the horticultural world and his name was well known amongst true enthusiasts. Tregye is a woodland garden with a stream, ponds and an old quarry. Most of the ferns here were introduced by Edward and many are not known in cultivation elsewhere. The current owners, John and Fiona Lanyon are trying to catalogue the collection and we were able to help name some of the ferns. Notable ferns are too numerous to mention them all, but some of the highlights are; *Plagiogyria pycnophylla*, a beautiful clumping fern with shiny pinnate dimorphic fronds, *Polystichum bigemmatum*, with graceful narrow fronds and 1 or 2 bulbils near the apex, *P. nepalense*, with glossy pinnate fronds naturalising on a wet cliff face. Also *Cornopteris quadripinnatifida* with tall, triangular, finely divided fronds and *C. decurrenti-alata* with large, coarsely lobed fronds. At the far side of one pond is a small grotto, home to a large colony of *Vandenboschia (Trichomanes) speciosum*. At the back of the cave a colony of another filmy fern has established possibly from spores spreading from plants introduced on tree fern trunks. This is *Polyphlebium (Trichomanes) venosum* and can only be seen with a torch or camera flash. *Leptopteris superba* and *L. hymenophylloides* at the cave entrance complete a filmy fern paradise. Shielding the cave entrance is a massive *Lophosoria quadripinnata* producing many bluish-white backed fronds and hanging above the cave entrance were huge fronds of *Blechnum novae-zelandiae* and *Dryopteris sieboldii*. Nearby, fronds of *Pteris wallichiana* towered overhead, *Culcita macrocarpa* is thriving in a marshy hollow and *Polystichum proliferum* is forming large spreading colonies increasing by means of the bulbils on their fronds. All these, and many more, were sheltered by a huge range of rare and exotic trees and shrubs. A truly wonderful place. A recent article about Edward Needham by Tom Hudson can be found in *The Plantsman*, New Series Volume 12 Pt 4, December 2013 pp. 256-261.

For those who had visited or had yet to go to Tregye, Chris Page opened his cottage and garden at Stithians to visitors. Here we were able to find shelter from the rain and meet



Dryopteris crispifolia

Photo left courtesy of
Tim Pyner

Blechnum cycadifolium

Photo right courtesy of
Tim Pyner



Cornopteris decurrenti-alata

Photo left courtesy of
Tim Pyner

*Blechnum
magellanicum*

Photo right courtesy of
Tim Pyner





Frond display at the HFF Fall Social

Photo above courtesy of Susie Egan

Plagiogyria pyncnophylla

Photo right courtesy of
Tim Pyner



Dicksonia antarctica

Photo left courtesy of
Tim Pyner



Lophosoria quadripinnata

Photo right courtesy of
Tim Pyner



the 4 authors of the recently published *Ferns, Clubmosses, Quillworts and Horsetails of Cornwall and the Isles of Scilly* (2012 publisher ERRICIS, Truro) namely Rosaline Murphy, Rosemary Parslow, Ian Bennalick and, of course, Chris. This was very enjoyable occasion and gave Chris an opportunity to talk about Cornish ferns, fern people, books and trips to a very appreciative audience.

Group members separated and made their way to Tremenheere near Penzance for lunch. The recently opened cafe on site was well patronised until the garden owner, Neil Armstrong, arrived to show us round. Tremenheere is an awesome garden, located on a sloping site with magnificent views of the sea and St. Michaels Mount, with its famous castle built on the rock just off the coast. Tremenheere is a new garden developed over the last 15 years although you would never guess it was so young. Neil has thrown his whole personality into the garden. Big tropical looking plants such as palms, bananas and bamboos are everywhere and at the top of the hill xeric plants dominate. Neil is also a keen collector of art and throughout the garden a variety of installations are found. I cannot do justice to the art and sculptures but much more information can be found at the Tremenheere Sculpture Garden website www.tremenheere.co.uk. In the wooded areas ferns are abundant including many that are rare and infrequently seen. This is one of the mildest parts of Cornwall and large tree ferns such as *Sphaeropteris* (syn. *Cyathea*) *medullaris* and *Alsophila tricolor* (syn. *Cyathea dealbata*) as well as *Dicksonia antarctica* are flourishing. A huge *Todea barbara* with 2m fronds was only planted 6 years ago as a small plant in a 3litre pot. This indicates that the growing conditions are ideal for ferns. A wide range of *Blechnums* are planted. Several *B. cycadifolium* from Juan Fernandez Islands are growing well as well as from the same islands *B. longicauda* with long, narrow fronds with bulbil at the tip. *B. magellanicum*, *B. tabulare*, *B. discolor*, *B. novae-zelandiae* and a superb *B. colensoi* were all here amongst an abundance of tree ferns. Reaching the top of the wooded valley we emerged to the stunning views. Here *Agave*, *Yucca*, *Dasyllirion*, *Furcraea* and *Xanthorrhoea* took centre stage with many palms on the slopes below. Several unidentified *Cheilanthes* collected in Mexico were found with careful searching. Strolling back down the slopes Neil pointed out a huge *Lophosoria quadripinnata* hidden amongst some bamboo. Tremenheere is an outstanding garden with a modern twist and despite its recent origin compares very favourably with many of Cornwall's long established gardens.

Sunday 29th September

The first site for our final day was Bosvigo, a relatively small garden just round the corner from our hotel. Owner Wendy Perry met us as rain started to fall and explained that the garden is full of interesting plants as well as ferns. We then started exploring the various parts of the garden. Most ferns were in the woodland garden as expected, with many cultivars, not my area of expertise. However under one tree was a colony of a puzzling *Dennstaedtia* that was eventually determined as the



Adiantum aleuticum 'Subpumilum'
Photo courtesy of Tim Pyner

Australian *D. davallioides*. Other interesting ferns were found in the courtyard including an odd *Cyrtomium* that is still unidentified. *Adiantum aleuticum* var. *subpumilum* is spreading by spores and naturalising on damp walls and retaining its dwarfed character. Most impressive were a couple of large *Onychium cryptogrammoides* also with young sporelings naturalising nearby.

The next garden was very different, the remarkable woodland site near Camborne planted by Sheila Tiffin. Sheila planted many tree ferns here that flourished until 2009 when a particularly harsh cold spell killed many of her more tender species. Despite this disaster many *Dicksonia antarctica* of all sizes survived and are again thriving. Once the group had found the meeting site along a small country lane Sheila lead us into the sheltered woodland. Immediately large native specimens of *Dryopteris affinis* and *Polystichum setiferum* started to appear. As we moved downhill the forest of *Dicksonia* became apparent. The tree ferns, interspersed with hardy palms and bamboos growing amongst the native trees, gave a surreal, peaceful, prehistoric atmosphere. This was enhanced by the wet conditions with rain dripping from the overhead branches. One large tree fern caught Martin's eye- a massive *Dicksonia fibrosa*, with harsher, rather spiky fronds compared to *D. antarctica*. Other ferns included *Todea barbara* and several *Blechnum* species including some nice *B. cycadifolium*. Clumps of a large *Pteris*, *P. umbrosa* from Australia were especially notable.

The afternoon was meant to be spent searching for native filmy ferns in rocky coastal moorland at Carn Galver. However the weather started to rapidly deteriorate and most members retreated to a nearby restaurant for shelter and Cornish cream teas. A brief break in the rain allowed a quick examination of the local dry stone walls where *Asplenium adiantum-nigrum*, *A. obovatum* ssp. *lanceolatum* and *Dryopteris aemula* were spotted. Most members eventually gave up and returned to the hotel but a small hardy team explored the moorland and managed to find both *Hymenophyllum tunbrigense* and *H. wilsonii*!

Despite poor weather affecting some parts of the meeting all the participants had very satisfying few days. Many rare and interesting ferns were seen in beautiful gardens in an amazing part of the country. Nearly 40 members and friends had a great time and we are very grateful to Martin and the garden owners for enabling such an entertaining and thoroughly enjoyable meeting to take place.

The Day That Pat Grew Wings: dreamtime for fernophiles...

Jo Laskowski ~ Seattle, WA

Pat was in her stumpery. She was looking at her ferns. She was looking at her stumps. She was thinking. She loved ferns. She loved tree ferns. She loved filmy ferns.

Every day Pat went to her stumpery. She was thinking. She was restless. One day Pat grew wings. She wanted to see the next thing that she could see. Pat was thinking. She wanted to see South Africa.

Pat flew and flew. She saw gardens and nurseries in Pretoria. It was hot. It was 85°F. She was hot. A dog peed on her. The dog's owner gave her two rocks for her trouble. The rocks were layered like the most beautiful cake in the whole world. She flew and flew. She saw Mac Mac Falls in Blyde Canyon. She saw God's Window in Blyde Canyon.

She slept in a rondavel in Kruger National Park. She trembled because she knew there were hungry, wild animals just outside.

Pat slept in Mount Sheba Hotel. She saw filmy ferns. She saw Lost City and Bourke's Luck Potholes. The Potholes were made in rocks layered like the most beautiful cake in the whole world.

She flew on to Golden Gate Hotel. Royal Natal National Park spread before her. She saw Sentinel Peak and Policeman's Helmet.

Everywhere she flew the land amazed her. She saw tree fern forests and orchids. Everywhere orchids. She saw filmy ferns and fern ferns and protea fields.

Pat flew so much and saw so much that she was tired. Pat flew and flew back to her stumpery. She needed a long time to figure out how to tell what she had seen.

Pat Riehl maintains her stumpery on Vashon Island, WA, USA. She dotes on her tree ferns and dreams of ferny films and keeps her flying license current.

And for the more literal among you:

Pat went on the British Pteridological Society tour to South Africa in February 2012. She presented on her trip on November 16, 2013, over a year and a half after her experience. She admitted to still being overwhelmed by what she had seen and experienced when she was in the country.

The trip started inland in Pretoria, South Africa, and ended in Durban, on the coast of the Indian Ocean. Everything had been minutely orchestrated, and the itinerary took them to locations in both Kruger and Royal Natal National Parks. Pat saw in a very, very short time the very, very best of the amazing South African landscape.

Pat recorded sightings of *Adiantum*, *Mohria*, *Asplenium*, *Doryopteris*. *Hypodematum*, *Dryopteris*, *Polystichum*, *Blechnum*, *Cheilanthes*. *Woodwardia*, *Woodsia*, *Selaginella*. *Lepisorus*, *Huperzia*. *Elaphoglossum*, *Anemia*, *Cyathea*, *Dicksonia*. *Hymenophyllum* and *Crepidomanes*. She credits "*Ferns of Southern Africa: A Comprehensive Guide*" for any of her acuity in identifying what she was seeing. She toted the heavy, 776 pp hardback until the flight out, when she discovered a paperback copy of same at the airport. That one made it home with her.

I don't have wings, and I can't fly. But I got to fly on her tales, thanks to the day that Pat grew wings.

Why did we have so many fancy ferns?

Alan Ogden

Alvechurch, England

The British Isles have only around fifty native fern species which is hardly enough interest to fuel the Victorian Fern Fever which has been so admirably described by Sarah Whittingham in her fascinating book on that subject. What the Victorians did find was an amazing variety of “fancy ferns” which kept growers and gardeners involved into the twentieth century until the world war diverted attention from plants and gardens. They called these modified ferns “varieties” and collected them enthusiastically with their many books and specialist nurseries to help them and formed societies to further their study. They found ferns with frills, ferns with crests, fronds that forked, huge ferns and tiny ones, there was even an extraordinarily attractive variety of the lady fern which was named for Queen Victoria!



Athyrium filix-femina ‘Victoriae’

Photo courtesy of Sue Olsen

Nowadays, use of the term ‘variety’ can cause confusion as taxonomists (those who classify and name the living world) use this term to describe a sub-group within a species. They call the differences at individual levels a ‘form’ or if the modified plant occurs in cultivation it is a ‘cultivar’ or in common parlance this is a ‘sport’ unless you are not a fern lover in which case it is a ‘monstrosity’ but we fern fans like them all the same. You can find a very clear explanation of fern terminology by Barbara Joe Hoshizaki in “Naming Ferns of Horticultural Interest”.

This profusion of variations has not occurred in other countries and as Sarah Whittingham notes, the supply in the British Isles was drying up as early as the 1900s. Christopher Page comments on this in his book “A Natural History of Britain’s Ferns” saying that it remains an enigma today just how Victorian pteridologists succeeded in finding such an extraordinary range of variation over a short period of time and that no similar range of wild finds or sports in cultivation have ever appeared since. Reginald Kaye has a chapter on variation in British Ferns in his book “Hardy Ferns” in which he quotes Druery’s mention of well over a thousand varieties which were described and named and Druery also describes the situation as “something absolutely unique in the world and unparalled anywhere outside our little group of islands”

When I became interested in ferns Reginald Kaye’s book was the main gardener’s reference and so I also became intrigued by this mystery. Christopher Page has suggested that the natural radioactivity of igneous rocks such as granite might be part of the explanation but he would not claim that this is the only explanation. We do know that radioactivity can induce mutations but I don’t know of any experiments to back up this suggestion.

Richard Rush tackled this subject in an article in the British Pteridological Society’s Bulletin of 1983 in which he poses the question “not only ‘why so many?’ but also ‘why so many then?’” and after a very clear exposition of the timing of the majority

of wild finds it appears to coincide with industrial pollution as the revolution in our manufacturing industries occurred. His proposition is “that at a certain dosage a pollutant or admixture of pollutants might have interfered genetically with some of our ferns.” This is an attractive suggestion for we know that elements such as arsenic, lead and antimony released in smoke from foundries are poisonous and who knows what noxious compounds were discarded by the infant chemical industries.

I had to agree with Richard Rush who ended his article by saying, “In short, I can take this no further.” and the mystery of our many fern forms remained both baffling and intriguing until I came across a fascinating book by Frank Ryan called “Virolution”. In it he explains how viruses have played a part in evolution which has been unsuspected until recently.

Viruses are not well understood by most people and the situation is not helped by the media which frequently confuse viruses with bacteria and sometimes use the terms interchangeably. Viruses are incredibly small and cannot reproduce themselves independently. The virus needs a chemical mechanism, a key to get inside the cell which means that it can only infect a specific organism. Plant viruses do not attack animals for example but we do know that every living thing is afflicted by them. Even bacteria have viruses which attack them.

The virus needs to get inside a cell where it can hijack the DNA which is the genetic material of the organism under attack and it uses this material to make copies of itself. The reproductive mechanism of the cell then churns out virus in profusion. When the cell dies under this onslaught the virus is released to go on to enter other cells and so the process continues.

I am simplifying matters considerably when suggesting that sometimes this process goes awry and a portion of the DNA could become attached to the virus. When this enters another cell the oddments of DNA could become part of the new victim. Something similar to this is used by scientists in genetic modification of plants and animals to make them more useful to farmers and growers and chunks of virus have even been found in our own recently mapped genome.

This is a thrilling development and could explain all the mysteries of our unusual ferns in the British Isles. The profusion of discoveries in the latter part of the nineteenth century looks very like an epidemic and the fact that it did not spread to other countries could be explained by our being cut off by sea.

Maybe, in years to come, investigations of our ferns’ genomes may find the explanation of the abundance of wonderful forms that were found here.

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SPORE EXCHANGE LIST 2014

Carolyn Doherty ~ Puyallup, WA

I would like to improve the process for ordering spore from our Spore Exchange for our members. Spore will continue to cost 50 cents per species. However, I have found that it is impossible to know the exact shipping costs until they are actually mailed. For this reason, I would like members who order spore in the future to either request it by mail to: Carolyn Doherty, Director of the Spore Exchange, 1905 43rd St. SE, Puyallup, WA 98372. Or by email to: fernspores@hotmail.com with the address where they wish it to be sent. I will fill the order and enclose the exact cost of the spore, shipping, and a padded mailer if needed (75 cents) in the order. I can also send this information by email. After the member receives their order, they may pay for it by return mail at the above address or by PayPal to the Hardy Fern Foundation if it involves foreign currency. Hopefully, this will improve our system and eliminate shipping cost guessing.

Also, I want to thank donors of spore who take the extra time to package the spore in individual packages. Please try to avoid using tape as spore sticks to it. Individual packaging saves me an enormous amount of time repackaging and labeling the spore when orders come in.

Fern Name	Year	Donor
<i>Adiantum aleuticum</i>	'11	Doherty
<i>Adiantum aleuticum</i> Subpumilum'	'10, '11	RSF
<i>Arachnoides</i> aff. <i>simulans</i>	'13	EMBG
<i>Arachnoides aristata</i>	'13	Olsen
<i>Arachnoides simplicior</i>	'11	Steffen
<i>Arachnoides simplicior</i> 'Variegata'	'11	RSF
<i>Asplenium trichomanes</i>	'12	RSF
<i>Athyrium atkinsonii</i>	'13	Gassner
<i>Athyrium attenuatum</i>	'13	Gassner
<i>Athyrium clivicola</i>	'13	Gassner
<i>Athyrium filix-femina</i> var. <i>angustum</i>	'12	Peachey
<i>Athyrium filix-femina</i> 'Frizelliae'	'11	RSF
<i>Athyrium niponicum</i> 'Pictum'	'11	RSF
<i>Athyrium ofoporum</i>	'11	Jeddeloh and Doherty
<i>Athyrium</i> sp. <i>yokoscense</i> ?	'12	Gassner
<i>Athyrium yokoscense</i> var. <i>alpicola</i>	'13	Gassner
<i>Athyrium</i> sp. narrow-red stemmed	'12	Gassner
<i>Blechnum australe</i>	'13	Gassner
<i>Blechnum niponicum</i>	'11	RSF
<i>Blechnum novae-zelandiae</i>	'11	EMBG
<i>Blechnum nudum</i>	'13	Gassner
<i>Blechnum penna-marina</i>	'12	RSF
<i>Blechnum spicant</i>	'11	RSF
<i>Blechnum spicant</i> 'Rickard's Serrate'	'10, '11	RSF and Duryee
<i>Cheilanthes lanosa</i>	'10	Peachey
<i>Cryptogramma</i> sp.	'11	Duryee
<i>Cyrtomium fortunei</i>	'10	Peachey
<i>Cyrtomium lonchitoides</i>	'11	RSF
<i>Cyrtomium macrophyllum</i>	'11	RSF
<i>Cyrtomium macrophyllum</i> var. <i>tukusicola</i>	'10, '11	RSF
<i>Deparia pseudoconilii</i>	'13	Gassner
<i>Diplazium pycnocarpon</i>	'13	Gassner
<i>Dryopteris gemula</i>	'12	Gassner
<i>Dryopteris bissetiana</i>	'11	RSF
<i>Dryopteris carthusiana</i> 'Cristata'	'09, '11	EMBG and Carl
<i>Dryopteris championii</i>	'12	RSF
<i>Dryopteris chrysocoma</i>	'13	Gassner
<i>Dryopteris clintoniana</i>	'11, '12	Carl and Gassner
<i>Dryopteris corleyi</i>	'12	Gassner
<i>Dryopteris crassirhizoma</i>	'11	RSF

<i>Dryopteris decipiens</i>	'10	RSF
<i>Dryopteris dickinsii</i> 'Incisa'	'12	Gassner
<i>Dryopteris erythrosora</i>	'11	Riehl and RSF
<i>Dryopteris expansa</i>	'12	Perasso
<i>Dryopteris expansa</i> var. <i>willeana</i>	'12	Gassner
<i>Dryopteris fragrans</i>	'13	Gassner
<i>Dryopteris intermedia</i>	'11	Rickard
<i>Dryopteris marginalis</i>	'11	RSF
<i>Dryopteris muenchii</i>	'12	Gassner
<i>Dryopteris polylepis</i>	'13	Olsen
<i>Dryopteris remota</i>	'13	RSF
<i>Dryopteris sacrosancta</i>	'11	RSF
<i>Dryopteris sieboldii</i>	'10	RSF
<i>Dryopteris sublacera</i>	'11	RSF
<i>Dryopteris wallichiana</i>	'11	Duryee
<i>Onychium japonicum</i>	'13	Olsen
<i>Phyllitis scolopendrium</i>	'11	Doherty
<i>Phyllitis scolopendrium</i> Crested	'11	EMBG
<i>Phyllitis scolopendrium</i> 'Saw Blade'	'11	Doherty
<i>Polypodium glycyrrhiza</i>	'10, '11	Doherty
<i>Polypodium interjectum</i>	'10	RSF
<i>Polypodium scolieri</i>	'12	RSF
<i>Polypodium vulgare</i> 'Bifidum'	'11	EMBG
<i>Polypodium vulgare</i> 'Cornubiense'	'12	RSF
<i>Polystichum aculeatum</i> Cristata Group	'13	EMBG
<i>Polystichum braunii</i>	'11	J. Taylor
<i>Polystichum deltodon</i>	'13	Gassner
<i>Polystichum makinoi</i>	'10	Peachey
<i>Polystichum mayebarae</i>	'13	Gassner
<i>Polystichum microchlamys</i>	'12	Hendricks
<i>Polystichum munitum</i>	'11	Doherty
<i>Polystichum neolobatum</i>	'11	RSF
<i>Polystichum retroso-paleaceum</i>	'10	RSF
<i>Polystichum setiferum</i> 'Lineare'	'12	Olsen
<i>Polystichum scopulinum</i>	'12	Duryee
<i>Polystichum squarrosum</i>	'12	Gassner
<i>Polystichum tsus-simense</i>	'11	RSF
<i>Polystichum wilsonii</i>	'12	Gassner
<i>Pteris cretica</i> 'Albo-lineata' (tender)	'11	Doherty
<i>Thelypteris limbosperma</i>	'12	Gassner
<i>Thelypteris palustris</i>	'11	Baxter
<i>Woodsia fragilis</i>	'11	RSF
<i>Woodsia pseudopolystichoides</i>	'13	Gassner
<i>Woodwardia unigemmata</i>	'12	Mandeville

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Olsen	Sue Olsen, Washington
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